

Figure S1

[illegible]

420 DxD 440 460 480
PbTPS-mdiTPS1 DYVYSHWDER GIGWGREDDL AVIDVTAMGL RILRLHGYNV SADVLKTFRD QNGEFLCFSG QTERGVTHML NVNRCSHVAM 442
PcTPS-mdiTPS1 DYVYSHWDER GIGWGREDDL ALIDVTAMGL RILRLHGYNV SADVLKTFRD QNGEFFRFSG QTERGVTHML NVNRCSHVAM 442
PcTPS-mdiTPS2 DYVYSHWDER GIGWGREDDL AVIDVTAMGL RILRLHGYNV SEDVLKTFRD QNGEFFCFSG QTERGVTHML NVNRCSHVAM 442
PcTPS-mdiTPS3 DYVYSHWDER GIGWGREDDL AVIDVTAMGL RILRLHGYNV SADVLKTFRD QNGEFFCFSG QTERGVTHML NVNRCSHVAM 442
PbTPS-mPIM1 DYVYSHWDER GIGWARENPV AYIDVMATG RILRLHRYNV SSDLKTFRD ENGEFFRFPG QSERGVTDML NLNRCSHVAF 459
PcTPS-mPIM1 DYVYSHWDER GIGWARENPV AYIDVMATG RILRLHRYNV SSDLKTFRD ENGEFFRFPG QSERGVTDML NLNRCSHVAF 459
PbTPS-mISO1 DYVYSHWGER GIGWARENPV ADIGVTAMGL RILRLNGYNV SSDVLRTFRD ENGEFFFSFMG QTERGVTDML NLNRCSHVAF 467
PcTPS-mISO1 DYVYSHWGER GIGWARENPV ADIGVTAMGL RILRLNGYNV SSDVLRTFRD ENGEFFFSFMG QTERGVTDML NLNRCSHVAF 467
PcTPS-LAS2 DYVYSHWDER GIGWARENPV DIDDTAMGL RILRLHGYNV SSDVLKTFRD ENGEFFCFLG QTQRGVTDML NVNRCSHVAF 441
PcTPS-LAS1 DYVYSHWDER GIGWARENPV DIDDTAMGL RILRLHGYNV SSDVLKTFRD ENGEFFCFLG QTQRGVTDML NVNRCSHVAF 448
PbTPS-LAS1 DYVYSHWDER GIGWARENPV DIDDTAMGL RILRLHGYNV SSDVLKTFRD ENGEFFCFLG QTQRGVTDML NVNRCSHVAF 448
PcTPS-LAS1 DYVYSHWDER GIGWARENPV DIDDTAMGL RILRLHGYNV SSDVLKTFRD ENGEFFCFLG QTQRGVTDML NVNRCSHVAF 441
PaTPS-ISO DYVYSHWDER GIGWARENPV DIDDTAMGL RILRLHGYNV SSDVLKTFRD ENGEFFCFLG QTQRGVTDML NVNRCSHVAF 458
PaTPS-LAS DYVYSHWDER GIGWARENPV DIDDTAMGL RILRLHGYNV SSDVLKTFRD ENGEFFCFLG QTQRGVTDML NVNRCSHVAF 450
AgTPS-AS DYVYSHWDER GIGWARENPV DIDDTAMGL RILRLHGYNV SSDVLKTFRD ENGEFFCFLG QTQRGVTDML NVNRCSHVAF 460
PgTPS-CPs EYVYRYWTNQ GIGWARDSPV KDVDTSMAF RLLRSHGFDV TAEAFNHFK QDDQFFCFFG QTKQVTGMY NLRYASQFSF 383
PgTPS-eKS DDYRYWMQR ETSREGKSLT DLYVSTSI AF MLLRLHGYDV PADVFCCYDL HSIE----- QSGEAVTAML SLYRASQIMF 352

500 520 540 560
PbTPS-mdiTPS1 PGETVMEAAK LCTERYLRNA LENVDADVWK GLKQNIERGEV EYALKYPWHR SLPRLEARSY IERYGPNVW LGKTMVTPY 522
PcTPS-mdiTPS1 PGETVMEAAK LCTERYLRNA LENVDADVWK GLKENIRGEV EYALKYPWHR SLPRLEARSY IERYGPNVW LGKTMVTPY 522
PcTPS-mdiTPS2 PGETVMEAAK LCTERYLRNA LENVDADVWK GLKQNIERGEV EYALKYPWHR SLPRLEARSY IERYGPNVW LGKTMVTPY 522
PcTPS-mdiTPS3 PGETVMEAAK LCTERYLRNA LENVDADVWK CLKQNIERGEV EYALKYPWHR SLPRLEARSY IERYGPNVW LGKTMVTPY 522
PbTPS-mPIM1 PGETVMEAAK LCTERYLRNA LENVNPLDKW DLKENIRGEV EYALKYPWLR RLPRLETRNY IEHYGANDVW LGKMMHMPY 539
PcTPS-mPIM1 PGETVMEAAK LCTERYLRNA LENVNPLDKW GLKENIRGEV EYALKYPWLR RLPRLETRNY IEHYGANDVW LGKMMHMPY 539
PbTPS-mISO1 PGETVMEAAK LCTERYLRNA LEDVDADVWK GLKQNIERGEV EYALKYPWLR SLPRLEARSY IERYGPNVW LGKTMVTPY 547
PcTPS-mISO1 PGETVMEAAK LCTERYLRNA LEDVDADVWK GLKQNIERGEV EYALKYPWLR SLPRLEARSY IERYGPNVW LGKTMVTPY 547
PcTPS-LAS2 PGETVMEAAK LCTERYLRNA LEDTGAFDKW ALKKNIRGEV EYALKYPWHR SMPRLEARSY IERYGPNVW LGKTMVTPY 521
PcTPS-LAS1 PGETVMEAAK LCTERYLRNA LEDTGAFDKW ALKKNIRGEV EYALKYPWHR SMPRLEARSY IERYGPNVW LGKTMVTPY 528
PbTPS-LAS1 PGETVMEAAK LCTERYLRNA LEDTGAFDKW ALKKNIRGEV EYALKYPWHR SMPRLEARSY IERYGPNVW LGKTMVTPY 528
PcTPS-LAS1 PGETVMEAAK LCTERYLRNA LEDTGAFDKW ALKKNIRGEV EYALKYPWHR SMPRLEARSY IERYGPNVW LGKTMVTPY 521
PcTPS-LAS1 PGETVMEAAK LCTERYLRNA LEDTGAFDKW ALKKNIRGEV EYALKYPWHR SMPRLEARSY IERYGPNVW LGKTMVTPY 528
PaTPS-ISO PGETVMEAAK LCTERYLRNA LEDVGAFDKW ALKKNIRGEV EYALKYPWHR SMPRLEARSY IEHYGANDVW LGKTMVTPY 538
PaTPS-LAS PGETVMEAAK LCTERYLRNA LEDVGAFDKW ALKKNIRGEV EYALKYPWHR SMPRLEARSY IEHYGANDVW LGKTMVTPY 530
AgTPS-AS PGETVMEAAK LCTERYLRNA LENVDADVWK AFKKNIRGEV EYALKYPWHR SMPRLEARSY IERYGPNVW LGKTMVTPY 540
PgTPS-CPs PGETVMEAAK LCTERYLRNA VFTKNFLEEK RAELKQRLDKW IAKGLKEEV EYALKFPWYA SQPRIDTRMY INQYRVDVW IGKALYRMP 463
PgTPS-eKS PGETVMEAAK LCTERYLRNA TVSRKYLDKR KENGGYDHN IVMKDLRGEV EYALVFPWYA SLERINRRY IDQYGVNDTW IAKTSYKIPC 432

580 RRWW 600 620 640
PbTPS-mdiTPS1 INNGKYLELA KLDFFNNVQSM QQKEILELRR WKKSSGFAEL NFRDRVAEI YFSIASTMFE PELATCRAIF TKTTVCLVIL 602
PcTPS-mdiTPS1 INNGKYLELA KLDFFNNVQSM QQKEILELRR WKKSSGFAEL NFRDRVAEI YFSIASTMFE PELATCRAIF TKTTVCLVIL 602
PcTPS-mdiTPS2 INNGKYLELA KLDFFNNVQSM QQKEILELRR WKKSSGFAEL NFRDRVAEI YFSIASTMFE PELATCRAIF TKTTVCLVIL 602
PcTPS-mdiTPS3 INNGKYLELA KLDFFNNVQSM QQKEILELRR WKKSSGFAEL NFRDRVAEI YFSIASTMFE PELATCRAIF TKTTVCLVIL 602
PbTPS-mPIM1 INDRKYLELA KLDFFNNVQSI HQKELRELRR WKKSSGFAEL NFRDRVAEI YFSIASTMFE PELATCRAIF TKTTVCLVIL 619
PcTPS-mPIM1 INDRKYLELA KLDFFNNVQSI HQKELRELRR WKKSSGFAEL NFRDRVAEI YFSIASTMFE PELATCRAIF TKTTVCLVIL 619
PbTPS-mISO1 INNGKYLELA KLDFFNNVQSI HQKELRELRR WKKSSGFAEL NFRDRVAEI YFSIASTMFE PELATCRAIF TKTTVCLVIL 627
PcTPS-mISO1 INNGKYLELA KLDFFNNVQSI HQKELRELRR WKKSSGFAEL NFRDRVAEI YFSIASTMFE PELATCRAIF TKTTVCLVIL 627
PcTPS-LAS2 ISNEKYLELA KLDFFNNVQFF HQKELQDIRR WKKSSGFSQL GFTRERVAEI YFSPASFLEF PEFATCRAIF TKTSNFTVIL 601
PcTPS-LAS1 ISNEKYLELA KLDFFNNVQFF HQKELQDIRR WKKSSGFSQL GFTRERVAEI YFSPASFLEF PEFATCRAIF TKTSNFTVIL 608
PbTPS-LAS1 ISNEKYLELA KLDFFNNVQFF HQKELQDIRR WKKSSGFSQL GFTRERVAEI YFSPASFLEF PEFATCRAIF TKTSNFTVIL 601
PcTPS-LAS1 ISNEKYLELA KLDFFNNVQFF HQKELQDIRR WKKSSGFSQL GFTRERVAEI YFSPASFLEF PEFATCRAIF TKTSNFTVIL 608
PaTPS-ISO ISNLYLELA KLDFFNNVQSL HQKELRDLRR WKKSSGFSQL GFTRERVAEI YFSPASFLEF PEFATCRAIF TKTSNFTVIL 618
PaTPS-LAS ISNLYLELA KLDFFNNVQSL HQKELRDLRR WKKSSGFSQL GFTRERVAEI YFSPASFLEF PEFATCRAIF TKTSNFTVIL 618
AgTPS-AS ISNLYLELA KLDFFNNVQSI HQTELQDLRR WKKSSGFSQL GFTRERVAEI YFSPASFLEF PEFATCRAIF TKTSNFTVIL 620
PgTPS-CPs YNNKTYLELA KADFNICQSI HRTLEHGIIR WYRESGLDEL NFRDRVAEI YFSPASFLEF PEFATCRAIF TKTSNFTVIL 620
PgTPS-eKS ISNDLELA KADFNICQSI HQTELHGIIR WYRESGLDEL NFRDRVAEI YFSPASFLEF PEFATCRAIF TKTSNFTVIL 620

660 DDxxD 680 700 720
PbTPS-mdiTPS1 DDLYDTHAS - LENIKLFNEA FKRWDLSLLD RMQEHMKICF LALYNLVNEI AQEGRERQGH DVLGYIRNLW ELVLEAYTNE 681
PcTPS-mdiTPS1 DDLYDTHAS - LESIKLFNEA FERWDSLLD RMQEHMKICF LALYNLVNEI AQEGRERQGH DVLGYIRNLW ELVLEAYTNE 681
PcTPS-mdiTPS2 DDLYDTHAS - LENIKLFNEA FKRWDLSLLD RMQEHMKICF LALYNLVNEI AQEGRERQGH DVLGYIRNLW ELVLEAYTNE 681
PcTPS-mdiTPS3 DDLYDTHAS - LENIKLFNEA FKRWDLSLLD RMQEHMKICF LALYNLVNEI AQEGRERQGH DVLGYIRNLW ELVLEAYTNE 681
PbTPS-mPIM1 DGFYDVHGS - AEDIMLFNEA VKRWDLSLLD RMQEHMKICF LALYNLVNEI AEEGRKRQGH DVLGYIRNLW ELVLEAYTNE 698
PcTPS-mPIM1 DGFYDVHGS - AEDIMLFNEA VKRWDLSLLD RMQEHMKICF LALYNLVNEI AEEGRKRQGH DVLGYIRNLW ELVLEAYTNE 698
PbTPS-mISO1 DDLYDAHGS - VEDIKLFNEA VKRWDLSLLD RMQEHMKICF LALYNLVNEI AEEGRKRQGH DVLGYIRNLW ELVLEAYTNE 706
PcTPS-mISO1 DDLYDAHGS - VEDIKLFNEA VKRWDLSLLD RMQEHMKICF LALYNLVNEI AEEGRKRQGH DVLGYIRNLW ELVLEAYTNE 706
PcTPS-LAS2 DDLYDAHGT - LDNLKLFSES VKRWDLSLLD QMPQDMKICF KGFYNTFNEI AEEGRKRQGH DVLGYIRNLW ELVLEAYTNE 680
PcTPS-LAS1 DDLYDAHGT - LDNLKLFSES VKRWDLSLLD QMPQDMKICF KGFYNTFNEI AEEGRKRQGH DVLGYIRNLW ELVLEAYTNE 687
PbTPS-LAS1 DDLYDAHGT - LDNLKLFSES VKRWDLSLLD QMPQDMKICF KGFYNTFNEI AEEGRKRQGH DVLGYIRNLW ELVLEAYTNE 687
PaTPS-ISO DDLYDAHGT - LDNLKLFSES VKRWDLSLLD QMPQDMKICF KGFYNTFNEI AEEGRKRQGH DVLGYIRNLW ELVLEAYTNE 680
PaTPS-LAS DDLYDAHGT - LDNLKLFSES VKRWDLSLLD QMPQDMKICF KGFYNTFNEI AEEGRKRQGH DVLGYIRNLW ELVLEAYTNE 697
AgTPS-AS DDLYDAHGS - LDDLKLFSES VKRWDLSLLD QMPQDMKICF KGFYNTFNEI AEEGRKRQGH DVLGYIRNLW ELVLEAYTNE 689
PgTPS-CPs RIFFSGENCFF AHRRRQFLDA FTRWDGRAMR DSPNSAKRLF SCFLRMVNLFF VQQAFFVQGR DISIHLREIW YRLVNSMMTE 591
PgTPS-eKS DDFDVGSS - EEIHSFVEA VRVWDEAATD GLSENVQILF SALYNTVDEI VQQAFFVQGR DISIHLREIW YRLVNSMMTE 591

740 NSE/DTE 760 780 800
PbTPS-mdiTPS1 AE-WSEAEFV PSFHEYIATA SISVSGPTLI LICVPLFTG-E LLTDHILSQI NYRSKFAYLI GLIGRLNDT KTYQAERGQ 759
PcTPS-mdiTPS1 AE-WSEAEFV PSFHEYIATA SISVSGPTLI LICVPLFTG-E LLTDHILSQI NYRSKFAYLI GLIGRLNDT KTYQAERGQ 759
PcTPS-mdiTPS2 AE-WSEAEFV PSFHEYIATA SISVSGPTLI LICVPLFTG-E LLTDHILSQI NYRSKFAYLI GLIGRLNDT KTYQAERGQ 759
PcTPS-mdiTPS3 AE-WSEAEFV PSFHEYIATA SISVSGPTLI LICVPLFTG-E LLTDHILSQI NYRSKFAYLI GLIGRLNDT KTYQAERGQ 759
PbTPS-mPIM1 AE-WSRAEHV PSFHEYIATA AISSALPTLV LIGVIFFTG-E VLTDHILSQI NYRSKFAYLI GLIGRLNDT KTYQAERGQ 776
PcTPS-mPIM1 AE-WSRAEHV PSFHEYIATA AISSALPTLV LIGVIFFTG-E VLTDHILSQI NYRSKFAYLI GLIGRLNDT KTYQAERGQ 776
PbTPS-mISO1 AE-WSEAKYV PSFHEYIATA SVSIALGTIV LIGVIFFTG-E VLTDHILSQI NYRSKFAYLI GLIGRLNDT KTYQAERGQ 784
PcTPS-mISO1 AE-WSEAKYV PSFHEYIATA SVSIALGTIV LIGVIFFTG-E VLTDHILSQI NYRSKFAYLI GLIGRLNDT KTYQAERGQ 784
PcTPS-LAS2 AE-WSAVRYV PSYDEYIENA SVSIALGTIV LISALFTG-E ILTDDILSKI GRDSRFLYLM GLTGRLVNDT KTYQAERGQ 758
PcTPS-LAS1 AE-WSAVRYV PSYDEYIENA SVSIALGTIV LISALFTG-E ILTDDILSKI GRDSRFLYLM GLTGRLVNDT KTYQAERGQ 765
PbTPS-LAS1 AE-WSAVRYV PSYDEYIENA SVSIALGTIV LISALFTG-E ILTDDILSKI GRDSRFLYLM GLTGRLVNDT KTYQAERGQ 765
PaTPS-ISO AE-WSAVRYV PSYDEYIENA SVSIALGTIV LISALFTG-E ILTDDILSKI GRDSRFLYLM GLTGRLVNDT KTYQAERGQ 758
PaTPS-LAS AE-WSAARYV PSFDEYIENA SVSIALGTIV LISALFTG-E ILTDDVLSKI GRDSRFLYLM GLTGRLVNDT KTYQAERGQ 775
PaTPS-ISO AE-WSAARYV PSFDEYIENA SVSIALGTIV LISALFTG-E ILTDDVLSKI GRDSRFLYLM GLTGRLVNDT KTYQAERGQ 767
AgTPS-AS AE-WSAARYV PSFDEYIENA SVSIALGTIV LISALFTG-E ILTDDVLSKI GRDSRFLYLM GLTGRLVNDT KTYQAERGQ 777
PgTPS-CPs AEDLTDAQD - -HEKLGTE A-----EIV VLTAAFLGRE TISPDLISHP DSS-IMKVT NTVCSSLRII ATYKEE- - - 686
PgTPS-eKS AQ-WARTHCL PSMHEYMENA EPSIALEPIV LSSLYFVGPK -LSEEIICHP EYVN-LMHLL NICGRLLNDI GGCKREAHQG 668

			820			840			860			880	
PbTPS-mdiTPS1	EVVSAIQCYM	KEHPEISEEE	ALEYVYTLL	KAIAADFKEEY	LKTK-QYVPN	NCRRLFFDHV	RLMQLFYNER	DGFTTHSDME	838				
PcTPS-mdiTPS1	EVVSAIQCYM	KEHPEISEEE	ALEYVYTLL	KAIAADFKEEY	LKTK-QYVPN	NCRRLFFDHV	RLMQLFYNER	DGFTTHSDME	838				
PcTPS-mdiTPS2	EVVSAIQCYM	KEHPEISEEE	ALEYVYTLL	NAIAADFKEEY	LKTK-QYVPN	NCRRLFFDHV	RLMQLFYKER	DGFTTHSDRE	838				
PcTPS-mdiTPS3	EVVSAIQCYM	KEHPEISEEE	ALEYVYTLL	KAIAADFKEEY	LKTK-QYVPN	NCRRLFFDHV	RLMQLFYKER	DGFTTHSDME	838				
PbTPS-mPIM1	EVASAIQCYM	KENPELSEEE	ALEYIYRLME	NALADFKREF	LKTK-D-VPE	YCRRLVFDNA	RSMQLIYMEG	DGFKLSHETE	854				
PcTPS-mPIM1	EVASAIQCYM	KENPELSEEE	ALEYIYRLME	NALADFKREF	LNTK-D-VPE	YCRRLVFDNA	RSMQLIYMEG	DGFKLSHETE	854				
PbTPS-mISO1	EVASAIQCYM	KDHPEFSEEE	ALKQIYTLME	NALADLKEEF	LKAK-D-VPD	KCKRLVFDYA	RSMQLFYQQG	DGFTLAPNME	862				
PcTPS-mISO1	EVASAIQCYM	KDHPEFSEEE	ALKQIYTLME	NALSDLKEEF	LKAK-D-VPD	KCKRLVFDYA	RSMQLFYQQG	DGFTLAPNME	862				
PcTPS-LAS2	EVASAVQCYM	KDHPEISEEE	ALKHYYTMD	NALDELNREF	VNNR-D-VPD	TCRRLVFETA	RIMQLFYMDG	DGLTLSHNME	836				
PcTPS-LAS1	EVASAVQCYM	KDHPEISEEE	ALKHYYTMD	NALDELNREF	VNNR-D-VPD	TCRRLVFETA	RIMQLFYMDG	DGLTLSHNME	843				
PbTPS-LAS1	EVASAVQCYM	KDHPEISEEE	ALKHYYTMD	NALDELNREF	VNNR-D-VPD	TCRRLVFETA	RIMQLFYMDG	DGLTLSHNME	843				
PtTPS-LAS	EVASAVQCYM	KDHPEISEEE	ALKHYYTMD	NALDELNREF	VNNR-D-VPD	TCRRLVFETA	RIMQLFYMDG	DGLTLSHNME	836				
PaTPS-ISO	EVASAVQCYM	KEHPEISEEE	ALKHYYTVME	NALDELNREF	VNNR-D-VPD	SCRRLVFETA	RIMQLFYMEG	DGLTLSHEME	853				
PaTPS-LAS	EVASAVQCYM	KDHPEISEEE	ALKHYYTVME	NALDELNREF	VNNR-E-VPD	SCRRLVFETA	RIMQLFYMDG	DGLTLSHETE	845				
AgTPS-AS	EVASAIQCYM	KDHPEISEEE	ALQHVVSVME	NALDELNREF	VNNK--IPD	IYKRLVFETA	RIMQLFYMQG	DGLTLSHME	854				
PgTPS-CPS	-----C--	-DSPSGTEED	--DRLKRAE	EGMGHLVRAV	YRHQYSPVPS	GVKRLCLVVG	KS--FYFA	---AHCNNEE	747				
PgTPS-eKS	KL-NSVTLYM	EENSQTMD	AIVYLKRTID	ESRQLLLKEV	L--RPSIVPR	ECKQLHWNMM	RILQLFYLKN	DGFT--SPT	743				

PbTPS-mdiTPS1	IKERVKKVLF	EPVA*	853
PcTPS-mdiTPS1	IKERVKKVLF	EPVA*	853
PcTPS-mdiTPS2	IKERVKKVLF	EPVA*	853
PcTPS-mdiTPS3	IKERVKKVLF	EPVA*	853
PbTPS-mPIM1	IKEHVKKILF	EPVA*	869
PcTPS-mPIM1	IKQHVKKILF	EPVA*	869
PbTPS-mISO1	IKQHVKKILF	EPVP*	877
PcTPS-mISO1	IKQHVKKILF	EPVP*	877
PcTPS-LAS2	IKEHVKNCLF	QPVA*	851
PcTPS-LAS1	IKEHVKNCLF	QPVA*	858
PbTPS-LAS1	IKEHVKNCLF	QPVA*	858
PtTPS-LAS	IKEHVKNCLF	QPVA*	850
PaTPS-ISO	IKEHVKNCLF	QPVA*	868
PaTPS-LAS	IKEHVKNCLF	QPVA*	860
AgTPS-AS	IKEHVKNCLF	QPVA*	869
PgTPS-CPS	VGNHVETVLF	QPVY*	762
PgTPS-eKS	MLGYVNAVIV	DPIL*	758

Figure S1. Complete amino acid alignment of the FL diTPS from jack pine and lodgepole pine with select previously characterized conifer diTPS. Amino acid residues that differ in more than 50% of the proteins are coloured in grey. Select conserved motifs are highlighted. Abbreviations: *Pbmd*iTPS1, *Pinus banksiana* monofunctional diTPS1; *Pcmd*iTPS1, *Pinus contorta* monofunctional diTPS1; *Pcmd*iTPS2, *P. contorta* monofunctional diTPS2; *Pcmd*iTPS3, *P. contorta* monofunctional diTPS3; *Pbm*PIM1, *P. banksiana* monofunctional pimaradiene synthase 1; *Pcm*PIM1, *P. contorta* monofunctional pimaradiene synthase 1; *Pbm*ISO1, *P. banksiana* monofunctional isopimaradiene synthase 1; *Pcm*ISO1, *P. contorta* monofunctional isopimaradiene synthase 1; *Pc*LAS2, *P. contorta* levopimaradiene/abietadiene synthase 2; *Pc*LAS1, *P. contorta* levopimaradiene/abietadiene synthase 1; *Pb*LAS2, *P. banksiana* levopimaradiene/abietadiene synthase 1; *Pt*LAS, *P. taeda* levopimaradiene/abietadiene synthase; *Pa*ISO, *Picea abies* isopimaradiene synthase; *Pa*LAS, *P. abies* levopimaradiene/abietadiene synthase; *Ag*AS, *Abies grandis* levopimaradiene/abietadiene synthase; *Pg*CPS, *Picea glauca* copalyl diphosphate synthase; *Pge*KS, *P. glauca* ent-kaurene synthase.